

ON THE PTEROPIDÆ OF INDIA AND ITS ISLANDS, WITH DESCRIPTIONS OF NEW OR LITTLE KNOWN SPECIES,—by G. E. DOBSON, B. A., M. B., *Staff Surgeon, H. M.'s British Forces.*

(With Plate XIV.)

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Although Dr. W. Peters has done so much towards clearing up the synonymy of the *Pteropidæ* as well as of other families of Chiroptera, much yet remains to be done before a correct list of the species can be obtained.

The state of confusion into which the species of this family have fallen, in common with most species of Chiroptera, is mainly due to the great imperfection of the original descriptions, from many of which it is impossible to recognise the family to which the species belongs.* This imperfection in description has arisen chiefly from the general ignorance respecting the Order which has prevailed amongst Zoologists, who seem to have shared the vulgar antipathy to these animals, if we may judge from the small amount of attention they have received, and also from the want of proper material in the Museums. Most of the *Pteropidæ* being large bats, and therefore unlikely to be preserved by collectors in spirit, have been described from dried specimens, and this also has added much to the imperfection of the description.

Much work, therefore, remains to be done both in obtaining well-preserved duplicates, in comparing them with the type specimens, and in producing from them descriptions from which it may be possible for naturalists in general to determine the species.

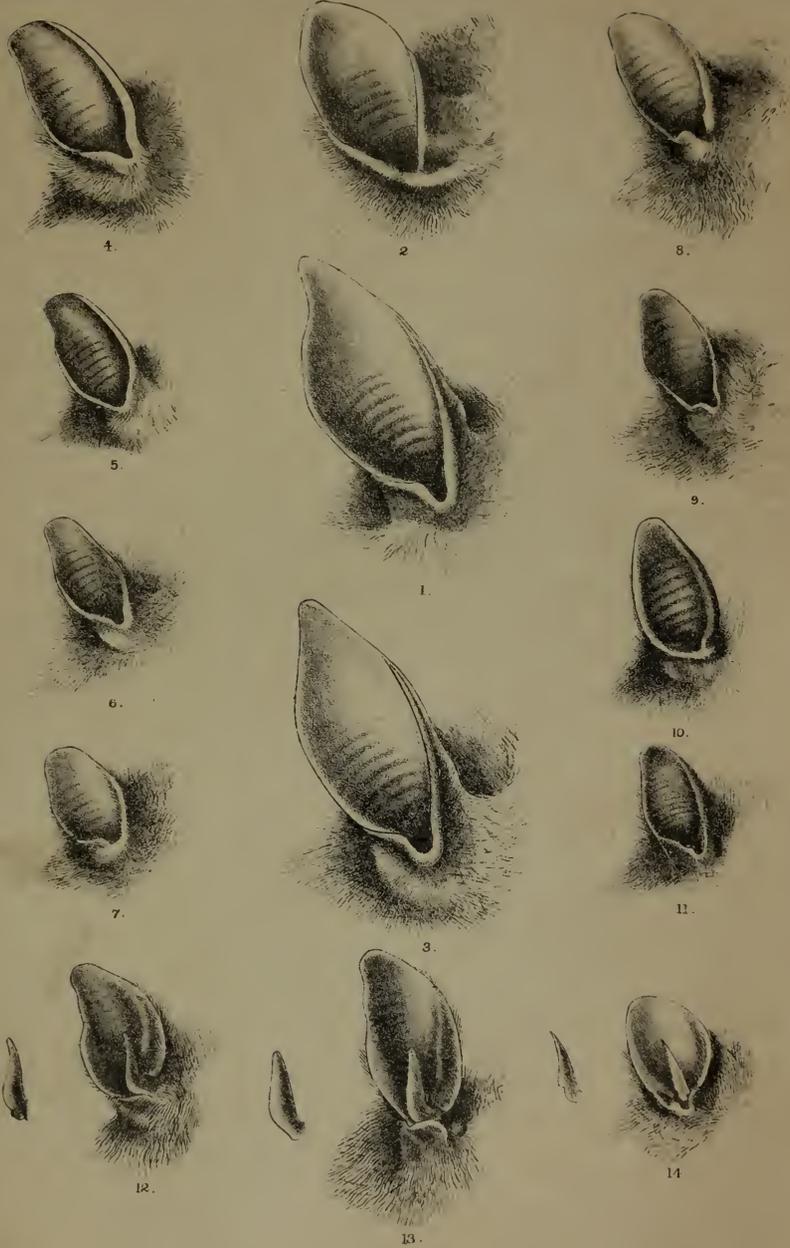
If the species of the genus *Pteropus*, as given by Drs. Peters and Gray,† be enumerated, there will be found to be not less than fifty.

The distribution of these fifty species is as follows:—

Continent of India and Burma,	1
Malay Archipelago,	25
China, Japan, and Loo-choo Islands,	4
Solomon Islands; New Caledonia; New Hebrides; Fiji Islands; Marianne and Viti Islands,	9
Australia,	5
Africa and its Islands,	6

* Thus Dr. J. E. Gray remarks (P. Z. S. Lond., 1866, p. 148)—“The generic characters of *Aello*, as given by Dr. Leach, occupy nearly a page of a quarto book, and yet no one has been able to discover the genus. One could not have a more convincing proof that it is not mere length of character that is required to define a genus.”

† See Peters in Monatsb. Berlin Akad., 1867, p. 323, and Gray's Catalogue of Monkeys, Lemurs and Fruit-eating Bats, 1870.



1. *Pteropus medius*. 2. *Pt. nicobaricus*. 3. *Pt. edulis*.
 4. *Cynopterus marginalis*. 5. *C. marginalis*, var. *andamanensis*.
 6. *C. sherzeri*. 7. *C. brachysoma*. 8. *Cynonycteris amplexicaudata*.
 9. *C. minor*. 10. *Eonycteris spelæa*. 11. *Macroglossus minimus*.
 12. *Vespertilio murinoides*. 13. *V. murinus*. 14. *Murina cyclotis*.

It is very remarkable that, supposing the localities to be correct or approximately so, one half of the whole number of species is distributed among the small islands of the Malay Archipelago, while a single species—*Pteropus medius*—is the sole representative, hitherto discovered, of the genus in the Continent of India and Burma.

That a large proportion of the species should be found in the Malay Archipelago and adjoining Islands might be expected, as these animals like monkeys can live only where a constant supply of fruit is attainable throughout the whole year, but the same conditions obtain in the greater part of the Peninsula of India, and especially in Equatorial Africa, yet scarcely one-seventh of the whole number has been found in these regions.

The Malay Archipelago is, therefore, either the original and special home of the genus from which a few species have wandered into India and Africa, or many species remain undiscovered in the latter countries, and probably many of the so-called species which go to make up the large number from Malayana have been founded on insufficient grounds.

I have not the least doubt that the real number of species is much less than that recorded, and that many described as new by Temminck and others will, with the accession of additional and more perfectly preserved specimens to the collections hitherto available in our Museums, be found referable to a few really distinct species. This may be especially expected in the case of those species that have been founded on differences in the colour of the fur, which appears to have been regarded by some zoologists as of equal importance with the colour of the feathers in birds.

I have elsewhere* dwelt at some length on the variability of the colour of the fur in many species of bats, and have shown that, in the *Pteropi* especially, individuals belonging to the same species present very different shades of colour according to sex age and season, and probably also, but in a less degree, according to locality.

Differences in the form of the skull and in the teeth have been also used to distinguish the species, but these, though of the greatest importance, are not satisfactory, if alone available as a means of diagnosis, for it should, surely, be possible to distinguish the species of a given vertebrate animal without first finding it necessary to kill and make a skeleton of it.

It is, therefore, desirable that, in the description of species, certain external characters may be given from which the living animal can be known, and these, I believe, may be found in the shape and relative size of the ears, and in the quality and distribution of the fur.

In all the Chiroptera, we find one or more of the organs of special sense greatly developed to supplement or, in some genera, almost wholly replace the visual organs (which in most cases are very rudimentary or, where

* Proc. Zool. Soc. of London, 1873.

moderately developed, can be of little use owing to the nocturnal habits of the animals), and this development varies remarkably according to family, genus, and species.

Thus the peculiar form of the nose-leaf taken with the shape of the ears at once characterises the *Rhinolophidae*, and each species of the family may be distinguished by secondary modifications of these organs alone.

And in those families of bats where the nostrils are not furnished with appendages, the form and relative size of the ear will generally be found to be the most important characters for readily and accurately determining the species, and, next to and with these, the quality and distribution of the fur.

I shall employ this principle of diagnosis in the following descriptions of the species of Frugivorous Bats known to inhabit Continental India and Burma, and the Islands of the Bay of Bengal.

Genus I.—PTEROPUS, Brisson.

Nostrils projecting; upper lip with a vertical groove in front bounded laterally by naked prominences; index finger with a distinct claw, metacarpal bone of second finger shorter than the index finger; wings from the sides of the hairy back; wing-membrane attached to the back of the first phalanx of the second toe; tail none.

Dentition :—*in.* $\frac{4}{4}$; *c.* $\frac{1-1}{1-1}$; *pm.* $\frac{2-2}{3-3}$; *m.* $\frac{3-3}{3-3}$.

A.—Ears acutely pointed.

PTEROPUS MEDIUS. Pl. XIV, Fig. 1.

Pteropus medius, Temminck, Monog. Mammal., I, p. 176.

„ *edwardsii*, (in part) Geoff., Ann. du Mus., vol. xv., p. 92.

„ *leucocephalus*, Hodgson, Journ. As. Soc. Beng., iv., p. 699.

„ *assamensis*, McClelland, Proc. Zool. Soc. Lond., vii., p. 148.

Ears long, with acutely pointed tips, the upper third of the outer margin concave beneath the tip; in fully grown individuals the longest diameter of the opening of the external ear, from the point of junction of the outer and inner margins below to the tip, measures one inch and a half.*

Nostrils projecting, with a deep intervening emargination; upper lip with a narrow vertical groove in front bounded laterally by naked rounded prominences continuous with the integument of the nostrils.

* The length of the ear (anteriorly) as given in the tables of measurements accompanying this paper (and also wherever mentioned in previous papers) has been determined by measuring the distance between the termination of the outer margin below and the tip. The breadth has been ascertained by means of a string passed round the ear posteriorly from the inner to the outer margin.

The ears are naked except at the bases posteriorly, and a narrow triangular portion covered with short hairs terminating towards the middle of the outer margin; anteriorly, the anterior flattened edge of the inner side of the conch is covered from the base upwards for about one-third of the length of the ear.

The face is naked in front of a line joining the inner angles of the eyes, and on either side of the naked space (which corresponds to the position of the nasal bones) a few long fine hairs arise from separate papillæ. The fur is rather dense and moderately long on the back of the head, neck, and shoulders, but short and appressed on the back, narrowing to about two inches in width across the loins. A narrow line of short fur passes outwards on to the wing membrane posterior to the humerus for rather more than half its length; the elbow is quite naked, but a few short hairs cover a narrow portion of the wing-membrane, about one inch and a half long, posterior to the forearm. The femur, and the interfemoral membrane as far as a line corresponding to the position of the semi-circular band on the under surface of the membrane are covered; the tibiæ are naked, or have only a few very short hairs; the feet are quite devoid of hair.

On the under surface, the whole body is well covered; the antibrachial membrane is similarly covered as far as a line drawn from the knee to a point about one inch posterior to the elbow joint, thence the hair passes outwards on the wing-membrane posterior to the forearm, terminating at about the beginning of the distal third of the radius. The thighs are covered, the legs and inter-femoral membrane are quite naked.

The nape of the neck and the shoulders are usually reddish yellow or golden yellow or pale straw colour, but every shade of these colours has been observed, the different colours and intermediate shades appearing to depend on sex, age, season, or locality. The darker shades are usually found in females.

The chest and upper part of the abdomen are either of the same colour as the nape of the neck or of a darker hue. The remainder of the fur black or dark brown often mixed with grayish hairs.

The fur of the neck is coarser and longer than that covering other parts of the body. In most male specimens a circular tuft of rigid unctuous hairs, of a deep reddish yellow colour, is found on each side of the neck, situated midway between the base of the ear and the origin of the ante-humeral portion of the wing-membrane from the shoulder. In a large male obtained near Calcutta, these tufts occupy a space one inch in diameter, and the hairs composing them measure about one-third of an inch in length.

Hab.—India generally, from Kachh to Burma, and from the Himalaya to Ceylon.

To this section of the genus belongs *Pt. edulis*, Péron et Lesueur, from

Java and Sumatra, which has been reported from Tenasserim,* and may probably be found in the Nicobar Islands. This species, the largest of known bats, may be readily distinguished from *Pt. medius* by its ears, and by the distribution and quality of the fur. The ears are proportionately shorter and narrower than in the Indian species, and the concavity of the upper third of the outer margin is much less distinct. In a specimen from Java, in the Indian Museum, the ears are about the same length as in the most adult specimen of *Pt. medius*, while its forearm exceeds that of the latter species by more than two inches, and the tibia by an inch and a half. Compared with *Pt. medius* the light coloured portion of the fur extends further down upon the shoulders, and the breadth across the loins occupied by hair is proportionately much greater: this is well seen when specimens of equal size are compared, the breadth of the fur in this position in the not fully grown *Pt. edulis* being nearly, if not quite, double that in the adult *Pt. medius*. Elsewhere the distribution of the fur is similar in both species, but the hair on the wing-membranes and legs is conspicuously much longer in *Pt. edulis*.

B.—Ears rounded at the tip.

PTEROPUS NICOBARICUS. Pl. XIV, Fig. 2.

- Pteropus nicobaricus*, Fitzinger, Sitzungs. Wien. Akad., 1860, p. 389, *nomen nudum*.
 „ *melanotus*, Blyth, Cat. Mammal. Mus. As. Soc. Beng., 1863, p. 20, *nom. nudum*.
 „ *nicobaricus*, Zelebor, Reise der Oester. Freg. 'Novara,' Säugethiere, 1868, p. 11.

Ears rounded off at the tip, their breadth nearly equal to their length; the upper third of the outer margin slightly flattened, not concave, the lower two-thirds convex; in fully grown individuals the longest diameter of the opening of the external ear, from the point of junction of the outer and inner margins below to the tip, scarcely exceeds one inch.

The distribution of the fur of the body is similar to that of *Pt. medius*, but the hair on the wing-membrane is very much shorter.

In some male specimens the colour of the fur also corresponds very closely with that of *Pt. medius*; generally, however, the lighter coloured portions of fur on the nape of the neck, and on the shoulders and chest, are of a deeper hue than in the latter species, usually dark ferruginous red or chestnut; females and young males are commonly *intensely black throughout*; in some female specimens the position of the light-coloured tippet in the male is indicated by a reddish tinge.

* A very badly preserved dried skin of an immature specimen of some species of *Pteropus*, in the Indian Museum, has been identified by Mr. Blyth with *Pt. edulis*, and the locality 'Tenasserim' recorded in his Catalogue. The specimen is in such a very bad condition I am able neither to confirm nor to correct Mr. Blyth's identification.

The skull differs from that of *Pt. medius* in being shorter, wider across the maxillary and nasal bones, and in having nearly all its processes and ridges much more strongly defined. The distance between the small anterior upper premolars exceeds that in *Pt. medius* by one-tenth of an inch. The *foramen ovale* is divided in the centre by a process of bone, in *Pt. medius* it is undivided. A post-orbital process of the zygomatic arch is present, though not so well developed as in *Pt. medius*.

The mandible is shorter and its rami deeper than in *Pt. medius*; the coronoid process is more developed vertically, its posterior margin is nearly straight, not deeply concave, and its superior angle is narrowly, not broadly rounded off as in the latter species.

The teeth are stouter in *Pt. nicobaricus* but their general characters are the same in both species.*

Hab.—Andaman and Nicobar Islands, probably Java also. An old dried specimen in the Indian Museum is labelled Java, but not numbered in Blyth's Catalogue.

Neither Fitzinger nor Blyth described this species, though they invented names for it. Zelebor's description occupies nearly two pages of a quarto book, and very careful measurements of the original specimen are given, yet, as his description is taken from a young individual and contains few really diagnostic characters, I was unable to feel certain that specimens obtained by me last year from the Andamans and Nicobars should be referred to this species. But Dr. Peters has lately, at my request, very kindly compared some specimens sent to him from the Indian Museum with the type specimens of *Pt. nicobaricus* in the Vienna Museum. He informs me that they agree in the form of the ear and feet. With this additional information I feel no hesitation in referring the specimen from which the above description is taken, to that species.

	Pteropus medius.					Pteropus nicobaricus.					Pt. edulis.
	Calcutta.	Maunbhumi.	Calcutta.	Pegu.	Assam.	Nicobars.	Andamans.	Andamans.	Andamans.	Java.	Java.
	♂	♂	♂	♂	♂	♂	♀	♂	♀	♀	♂
Length, head and body,	9.0	...	7.5	9.0	10.5	10.5	8.8	8.0	9.8	9.0	13.0
" head,	3.1	3.15	2.75	3.0	3.0	3.0	3.0	3.0	2.9	2.8	3.5
" ear (anteriorly),	1.5	1.40	1.45	1.5	1.45	1.05	1.05	1.1	1.05	1.05	1.5
Breadth, ear,	0.85	...	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.75
Length, from ear to tip of nostril,	2.7	...	2.4	2.6	2.8	2.65	2.45	2.5	2.35	2.35	2.8
" from eye to tip of nostril,	1.3	...	1.1	1.15	1.2	1.15	1.15	1.10	1.15	1.05	1.2
" forearms,	6.6	6.7	6.0	6.2	6.3	6.5	5.8	5.9	5.8	5.4	8.5
" thumb,	2.7	2.7	2.8	2.65	2.5	2.8	2.5	2.6	2.6	2.35	3.0
" second finger,	12.5	13.5	11.5	11.8	11.9	12.5	11.0	10.5	11.5	11.5	16.0
" fourth finger,	8.5	8.5	7.8	8.0	8.0	8.5	7.4	7.8	7.8	8.0	10.5
" tibia,	3.0	3.2	2.7	2.8	2.8	3.0	2.8	2.7	2.6	2.6	4.0
" foot and claws,	2.3	2.3	2.0	2.0	2.0	2.0	1.7	2.0	2.0	2.0	2.4
" calcaneum,	1.0	0.9	0.85	0.8	0.8	0.9	0.65	0.85	...	0.75	1.5

* For the dentition of the genus *Pteropus* see De Blainville, *Ostéographie*.

Genus II.—CYNOPTERUS,* F. Cuvier.

Nostrils projecting; upper lip with a vertical groove in front, bounded laterally by naked prominences; index finger with a distinct claw; metacarpal bone of second finger exceeding slightly in length the index finger; wings from the sides of the hairy back, wing-membrane attached to the base of the first toe; tail short, distinct.

Dentition:—*in.* $\frac{4}{4}$; *c.* $\frac{1-1}{1-1}$; *pm.* $\frac{2-2}{3-3}$; *m.* $\frac{2-2}{2-2}$.

CYNOPTERUS MARGINATUS. Pl. XIV, Fig. 4.

Pteropus marginatus, Geoffroy, Ann. du Mus. xiv, p. 97.

„ *pyrivorus*, Hodgson, Proc. Zool. Soc. Lond., 1836, p. 36.

Cynopterus affinis, Gray, Cat. Mammal., 1850, xix, p. 38.

Eleutherura marginata, Gray, Catalogue of Monkeys, Lemurs and Fruit-eating Bats, 1870, p. 118.†

Ears large, rounded at the tip, with a slight but distinct concavity of the outer margin immediately beneath the tip; both the outer and inner margins are bordered with white; the white border along the inner margin is about one-twelfth of an inch wide, and contrasts strongly with the dark brown colour of the ear; the outer margin terminates below without forming a lobe at the base.

Nostrils projecting, with a deep intervening emargination. The upper lip marked in the centre, as in *Pteropus*, with a narrow vertical groove bounded laterally by naked rounded prominences continuous with the integument of the nostrils.

The ears are naked posteriorly except at their bases; anteriorly, a few hairs appear on the conch along the outer side of the white border of the inner margin of the ear, and, similarly, along the inner side of the white border of the outer margin. On the upper surface, the fur of the back extends upon the wing-membrane nearly as far as a line joining the elbow and knee joints, also, thinly, upon the humerus, the femur, and proximal end of the tibia. Beneath, the antebrachial membrane is covered with moder-

* I have placed the genus *Cynopterus* next *Pteropus* as I believe it presents more affinities with that genus than any of the other genera of *Pteropidae*. The species of these genera agree very closely in the form of the nostrils and of the narrow emargination on the upper lip bounded by naked prominences. In *Cynonycteris* this emargination is wide and deep with slanting sides, altogether very different from the same part in *Pteropus*. In habit also the species of *Cynopterus* and *Pteropus* perfectly agree; they are all strictly frugivorous bats and live in trees, while the species of *Cynonycteris* are commonly found in caves, and I have been informed that a colony of *C. amplexicaudata* living near the sea were seen to feed on Mollusca left exposed by the tide.

† For a complete list of synonyms of this species see Peters in Monatsb. Berlin Akad., 1867, p. 866, and 1869, p. 395.

ately long thinly spread hairs, and the wing-membrane is clothed to about the same extent as on the upper surface, the hairs also passing outwards in a narrow band posterior to the forearm. The colour of the fur is extremely variable, dark brown, reddish-brown, snuff-brown or olive-brown, sometimes with a bluish tinge throughout.

The first upper premolar is minute, and in the centre of the space between the canine and second premolar; the second premolar is about equal to the lower canine in vertical extent.

CYNOPTERUS MARGINATUS, var. ANDAMANENSIS. Pl. XIV, Fig. 5.

This is, I believe, a permanent variety of *C. marginatus*. It is readily distinguished by the small size of the ears which are similarly margined with white. The relative size is very well shown in the accompanying illustration.

Specimens of young individuals of *C. marginatus* from Bengal with forearm bones nearly half an inch shorter than specimens of adult animals of this variety from the Andamans have considerably larger ears.

CYNOPTERUS SHERZERI. Pl. XIV, Fig. 6.

Pachysoma sherzeri, Fitzinger, Sitzungs. Wien. Akad., 1860, p. 389, (*nom. nudum*).

Cynopterus marginatus, var. *Pachysoma Sherzeri*, Zelebor, Reise der Oester. Freg. 'Novara,' Säugethiere, p. 11, 1868.

This species, like *Pteropus nicobaricus*, was named but not described by Fitzinger, and Zelebor regards it as a variety only of *C. marginatus*. It is at once distinguished from that species by its small and narrow ears which are also *not* margined with white. When adult specimens of *C. marginatus* and of this species are compared together, the difference in the size and shape of the ears is very striking.

The muzzle is thicker, and the colour of the fur much darker than in any specimen of *C. marginatus*.

Zelebor mentions that the ears of the specimens obtained at Car-Nicobar are margined with white, but I have been unable to detect even the slightest trace of a white border in the ears of several specimens examined by me. Therefore, either Zelebor has been mistaken, or the white bordering of the ears is not a constant character in this species, or I have wrongly identified the species here described with *C. sherzeri*. But although it is quite impossible to identify the species here described with that obtained during the Novara Expedition at Car-Nicobar Island from Zelebor's description (which consists merely of some unimportant remarks on the colours of the fur, wing-membrane, and eyes), yet as the animals which furnished the above description were taken not only at the same island—Car-Nicobar—but also from the same place on that island, namely, from the leaves of the cocoa-nut palms, I think it highly probable that they

belong to the same species, and, accordingly, to avoid the possibility of introducing a fresh synonym, I have retained Fitzinger's name.

CYNOPTERUS BRACHYSOMA. Pl. XIV, Fig. 7.

Cynopterus brachysoma, Dobson, Journ. A. S. B., 1871, p. 260.

I have little to add to my original description of this species.

The ears are much rounded off above, and the upper third of the outer margin is straight or slightly convex; the presence of a rounded lobe at the base of the outer margin at once distinguishes this species.

The difference in the measurements of the breadth of the ear given with the original description and in the table below is due to the measurement having been taken in the former case across the concavity of the ear, anteriorly; in the latter, by means of a string round the convexity, posteriorly.

Genus III.—CYNONYCTERIS, Peters.

Nostrils projecting; upper lip with a wide groove in front with smooth not elevated margins; index finger with a distinct claw; metacarpal bone of second finger exceeding, or equalling, the index finger in length; wings from the sides of the hairy back; wing-membrane from the base of the second toe; tail short, distinct.

Dentition:—*in.* $\frac{4}{4}$; *c.* $\frac{1-1}{1-1}$; *pm.* $\frac{2-2}{3-3}$; *m.* $\frac{3-3}{3-3}$.

CYNONYCTERIS AMPLEXICAUDATA. Pl. XIV, Fig. 8.

Pteropus amplexicaudatus, Geoff. Ann. du Mus., Vol. xv, p. 96.

„ *Leschenaultii*, Desmarest, Mammal., p. 110.

„ *amplexicaudatus*, Temm., I, p. 200.

„ *seminudus*, Kelaart, Journ. As. Soc. Beng., xxi, p. 345.

„ *Leschenaultii*, Blyth, Cat. Mammal. Mus. As. Soc. Beng., p. 21.

Head long, triangular; upper lip with a wide groove directly continuous with the emargination between the nostrils, the edges of the groove smooth, not thickened as in *Pteropus* or *Cynopterus*; ears moderate, triangular, rounded at the tip, the upper half of the outer margin straight, the lower half convex.

Posteriorly the ears are naked except at their bases, anteriorly the conch is covered with a few very short fine hairs. The fur of the body extends upon the humerus and upon the fleshy part of the forearm, the remaining part to the carpus has only a few very fine hairs. The portion of the back and wing-membrane covered with fur across the loins is not more than an inch in breadth. The interfemoral membrane is densely covered with hair at the root of the tail, and on either side as far as lines drawn from the knee joints to the base of the free portion of the tail; the remaining portion, the legs and a considerable part of the wing-membrane beyond, are clothed with short, thinly-spread fur which extends along the wing membrane and legs

to the back of the feet. Beneath, the ante-humeral membrane is clothed with rather long thinly-spread fur, and the wing-membrane is similarly covered as far as a line drawn from the knee to a point about half an inch posterior to the elbow, whence the fur extends outwards to the carpus. The interfemoral membrane, the legs, and the feet are covered with a few very short hairs.

First upper premolar minute, equally distant from the canine and second premolar; second premolar exceeding lower canine in vertical extent; first lower premolar small, less than half the size of the second premolar; second premolar nearly equal to lower canine in vertical extent.

Hab.—From the Persian Gulf to the Philippine Islands. Bengal; Southern India; Ceylon; Burma; Celebes; Amboyna; Timor; Aru Islands.

CYNOXYCTERIS MINOR, n. sp. Pl. XIV, Fig. 9.

Ears smaller and much narrower than in *C. amplexicaudata*; muzzle also proportionately shorter.

The minute first upper premolar is closely wedged in between the canine and second premolar; in *C. amplexicaudata* it is separated by a narrow interval from both these teeth.

The distribution of the fur is somewhat similar to that of *C. amplexicaudatus*, but it is much shorter on the wing-membrane and almost absent from the backs of the tibiæ, from the adjoining portions of wing-membrane, and from the feet.

Hab.—Java.

	Cynopterus.								Cynonycteris.		
	C. marginatus.		C. andamanensis.			C. sherzeri.		C. brachysoma.	C. amplexicaudatus.		C. minor.
	Calcutta.	Darjeeling.	Andamans.	Andamans.	Andamans.	Car-Nicobar.	Car-Nicobar.	Andamans.	Persian Gulf.	Bengal.	Java.
	♂	♂	♀	♂	♀	♀	♀	♀	♂	♂	♀
Length, head and body,	4.4	3.9	3.7	3.3	3.4	3.75	3.7	2.9	4.1	4.3	3.7
" tail,	0.4	0.6	0.4	0.35	0.4	0.55	0.55	0.25	0.65	0.65	0.45
" head,	1.5	1.5	1.4	1.3	1.4	1.25	1.3	1.25	1.7	1.7	1.55
" ear (anteriorly),	1.0	0.9	0.7	0.7	0.68	0.6	0.63	0.6	0.8	0.8	0.68
Breadth, ear,	0.6	0.6	0.4	0.4	0.4	0.3	0.32	0.4	0.55	0.55	0.35
Length, from ear to tip of nostril, .....	...	1.2	1.15	1.0	1.15	1.0	1.05	1.0	1.4	1.4	1.3
" forearm,	3.0	2.9	2.6	2.6	2.8	2.7	2.7	2.2	3.2	3.15	2.8
" thumb,	1.1	1.1	1.0	0.95	1.0	1.0	1.0	0.9	1.25	1.0	0.9
" second finger,	5.0	4.9	4.7	4.2	4.7	4.7	4.75	4.0	5.4	5.2	4.4
" fourth finger,	3.7	3.5	3.3	3.1	3.5	3.4	3.5	3.0	3.7	3.9	3.3
" tibia,	1.1	1.1	1.0	0.95	1.05	1.0	1.0	0.8	1.35	1.4	1.05
" foot and claws,	0.7	0.7	0.6	0.55	0.6	0.6	0.6	0.5	1.0	0.85	0.75

Genus IV.—EONYCTERIS, (nov.)

Nostrils not projecting; upper lip with a shallow vertical groove in front; index finger without a claw; thumb short, part of terminal phalanx included in the wing-membrane; metacarpal bone of second finger equal to the index finger in length; wings from the sides of the hairy back; wing-membrane from the base of the first toe; tail short, distinct.

Dentition:—*in.* $\frac{4}{4}$; *c.* $\frac{1-1}{1-1}$; *pm.* $\frac{2-2}{3-3}$; *m.* $\frac{3-3}{3-3}$.

First upper premolar minute.

EONYCTERIS SPELÆA. Pl. XIV, Fig. 10.

Macroglossus spelæus, Dobson, Journ. A. S. B., 1871, p. 261, pl. x, fig. 3, 4.

When first describing this species, I placed it in the genus *Macroglossus* on account of its very close resemblance to *M. minimus*, the type of that genus, in the form, number and arrangement of the teeth. Subsequently, however, in the MS. of a 'Catalogue of Chiroptera in the Indian Museum' I placed it in a separate subgenus '*Eonycteris*' on account of the very different attachment of the wing-membrane to the foot and sides. Lately, Dr. Peters writes to me that he is convinced, after a very careful examination of specimens sent to him from the Indian Museum, that the differences existing between this species and *M. minimus* are of generic importance, and require the formation of a new genus for its reception.

Since I described this species in 1871 I have come to regard the dentition of the Chiroptera as of less importance in their classification than many other characters. I believe that, although the teeth of *Macroglossus minimus* and *Eonycteris spelæa* correspond very closely, these species yet present many structural differences of more than subgeneric importance, and I agree with Dr. Peters that the latter species should be placed in a separate genus. I have, accordingly, raised my subgenus '*Eonycteris*' to the rank of a distinct genus of *Pteropidæ*.

Genus V.—MACROGLOSSUS, F. Cuvier.

Nostrils not projecting, upper lip not grooved in front; index finger with a distinct claw; thumb moderate; metacarpal bone of second finger equal to, or longer than, index finger; wings from the sides, their points of attachment separated by a considerable interval from the spine: wing-membrane from the base of the fourth toe; tail very short.

Dentition:—*in.* $\frac{4}{4}$; *c.* $\frac{1-1}{1-1}$; *pm.* $\frac{2-2}{3-3}$; *m.* $\frac{3-3}{3-3}$.

First upper premolar nearly equal in size to the second.

MACROGLOSSUS MINIMUS. Pl. XIV, Fig. 11.

Pteropus minimus, Geoff. Ann. du Mus., xv, p. 97.

Macroglossus minimus, Temminck, Monogr. de Mammal., I, p. 191.

Pteropus rostratus, Horsfield, Zool. Researches in Java.

This species is so well-known, and has been redescribed so carefully by Temminck, that no further description of it is here necessary.

It is found in abundance in the deep warm valleys about Darjiling. It extends from India through Burma to the Malay Archipelago.

DESCRIPTION OF A NEW SPECIES OF VESPERTILIO FROM THE NORTH-WESTERN HIMALAYA,—by G. E. DOBSON, B. A., M. B.

VESPERTILIO MURINOIDES, n. sp., Pl. XIV, Fig. 12.

This species is closely allied to *V. murinus* of Europe, from which, however, it is readily distinguished by the following characters:—

The general form of the ear is triangular, with narrow rounded tips: the inner margin is very faintly convex, almost straight, in its upper third, and the outer margin is concave beneath the tip, the remaining portion convex with a faint concavity opposite the base of the tragus.

In *V. murinus* the inner margin of the ear is strongly convex from the base to the tip, the concavity of the outer margin beneath the tip is very feeble, and there is a distinct emargination, almost angular, opposite the base of the tragus, succeeded by a well-developed terminal lobe; the general form of the ear is, moreover, oval, not triangular.

The tragus is slender and acutely pointed, with a quadrangular lobe at the base of its outer margin. In *V. murinus* the tragus is subacutely pointed, and the lobe at the base of the tragus is remarkably small.*

The fur is dark brown above, with light brown tips; beneath, dark brown, almost black, with grayish tips.

The first upper premolar is very small, scarcely visible from without, and not much larger than the second. In *V. murinus* this tooth is distinctly visible from without and much larger than the second premolar.

The specimen (an adult female preserved in spirit) from which the above description is taken, was obtained at Chamba, at an elevation of about 3000 feet, by H. McLeod Hutchison, Esq., H. M.'s 14th Regiment.

* The relative shape and size of the ears and tragi of *V. murinus* and *V. murinoides* are well shown in Pl. XIV, figs. 12, 13.

A dried specimen in the Indian Museum, labelled *V. murinus*, belongs also to this species. It is said in Blyth's Catalogue to have been sent from Masuri by Captain Hutton. The measurements of both specimens compared with those of *V. murinus*, L. from Europe are as follows:—

	<i>V. murinoides.</i>		<i>V. murinus.</i>	
	♂	♀	♂	♀
Length, head and body,	2.7	2.5	2.7	3.0
" tail,.....	2.1	2.1	1.9	2.3
" head,.....	0.95	0.9	1.05	1.1
" ear, (anteriorly),.....	0.8	0.85	1.0	1.0
Breadth, ditto, .....	...	0.58	0.75	0.75
Length, tragus, .....	...	0.4	0.1	0.5
Breadth, ditto, .....	...	0.1	0.12	0.12
Length, forearm,	2.2	2.1	2.25	2.5
" thumb, .....	...	0.4	0.5	0.5
" second finger,	3.75	3.4	3.3	4.3
" fourth ditto,.....	2.8	2.8	2.65	3.3
" tibia,.....	0.9	0.9	0.95	1.05
" calcaneum,	0.9	0.9	0.7	0.9
" foot and claws,	0.5	0.5	0.5	0.6

The measurements given in the third column are those of a not fully grown specimen of *V. murinus*.

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*Explanation of Plate XIV.*

1. Ear of *Pteropus medius*.
2.   "      "      *nicobaricus*.
3.   "      "      *edulis*.
4.   "      *Cynopterus marginatus*.
5.   "      "      "      var. *andamanensis*.
6.   "      "      *sherzeri*.
7.   "      "      *brachysoma*.
8.   "      *Cynonycteris amplexicaudata*.
9.   "      "      *minor*.
10.  "      *Eonycteris spelæa*.
11.  "      *Macroglossus minimus*.
12.  "      *Vespertilio murinoides*.
13.  "      "      *murinus*.
14.  "      *Murina cyclotis*.